7-19-1997

DDASaccident228

Humanitarian Demining Accident and Incident Database
AID

DDAS Accident Report

Accident details

Report date:	18/05/2006	**Accident number:**	228
Accident time:	not recorded	**Accident Date:**	19/07/1997
Where it occurred:	Sevarlije, Doboj	**Country:**	Bosnia Herzegovina
Primary cause:	Management/control inadequacy (?)	**Secondary cause:**	Field control inadequacy (?)
Class:	Missed-mine accident	**Date of main report:**	23/07/1997
ID original source:	WL/EB/VT	**Name of source:**	BiH MAC
Organisation:	Name removed		
Mine/device:	PMA-3 AP blast	**Ground condition:**	agricultural (abandoned) bushes/scrub grass/grazing area trees
Date record created:	17/02/2004	**Date last modified:**	17/02/2004
No of victims:	1	**No of documents:**	2

Map details

Longitude:		**Latitude:**	
Alt. coord. system:	BQ683499	**Coordinates fixed by:**	
Map east:		**Map north:**	
Map scale:	Doboj	**Map series:**	M709
Map edition:	WGS 84	**Map sheet:**	2784 III
Map name:			

Accident Notes

inadequate communications (?)

inadequate medical provision (?)

inadequate training (?)

inappropriate vegetation cutting tool (?)

pressure to work quickly (?)

protective equipment not worn (?)

vegetation clearance problem (?)

inadequate area marking (?)

Accident report

This was one of two incidents occurring at the same site on the same day.

The demining group involved in the accident deployed two-man teams using a one-man drill, in which one deminer cleared undergrowth, used the detector and excavated finds while the other "controlled" him.

An accident report was prepared for the country MAC by an ex-pat Technical advisor, an advisor to the funder and a representative of the company involved. That report was not among the records made available by the country MAC [the UN MAC handed over to local control on 1st July 1998.] A copy was found from other sources and the following summarises its content. The full report covering both accidents is under *Related papers* at the “Other documents” tab.

The area where the accident occurred was a former defensive line that was known to be mined. It was "heavily vegetated" and included several bunkers and defensive positions. The demining team started work at the site on the day of the accident. The demining company had employed one of the soldiers who had laid mines in the area during the conflict, and his information augmented that available from the country MAC's mined area database. The group were engaged in clearing access lanes into the suspect area from the Control Point in preparation for clearing around 1200 square metres of "rolling countryside" mostly around the top of a hill.

The team at the site comprised an ex-pat Team Leader (Gurkha), six deminers, a medic and a translator. An external QA monitor was on site at all times to guarantee that standards were met.

The access lane in which the accident occurred was approximately 350 metres long and followed "a winding course". Two other lanes in other directions had also been started. The group began work at the site at 06:00. They were using Ebinger detectors and clearing foliage with a machete. "Full protective clothing and headgear" was available for all personnel.

Prior to the accident the Team Leader had "used a machete to clear foliage and to inspect uncleared ground" in the accident lane. He did not use a detector or prodder. He advanced ten metres in this way, then handed over to the victim. The ten metres were counted as "cleared". The Team Leader was reported to have "used this system on other occasions to encourage deminers to clear areas faster". He was not wearing any protective equipment. During this time he missed what the report states was a "PMA" [I infer a PMA-3].

The deminers returned to work and extended the lane when one stepped on a PMA-3 [see details of the other Bosnia Herzegovina accident occurring on 19th July 1997]. The Team Leader helped in his evacuation during which several deminers passed several times over the mine that the Team Leader had missed.

After the ambulance had left the Team Leader told deminers to collect their tools and returned to the site of the accident himself. As he walked in the area he had earlier cleared, he stepped on a mine in the centre of the lane and ten metres behind the end-of-lane making.

Deminers evacuated him to the Control Point where "fortuitously" the ambulance vehicle returned from the first trip to the hospital and completed his evacuation to Doboj hospital. He was subsequently (within the next two days) evacuated to a hospital in the UK where his foot was "rebuilt". [Because the previous evacuation took about 30 minutes, I infer a similar evacuation time for this accident.]

The investigators found that the site had no easy communications beyond the task site. It was necessary to climb a nearby hill and plug-in to an antennae mast to achieve contact with the demining company's local HQ or other groups.

The ambulance was an unconverted truck without provision for a stretcher.

A one day retraining period had been completed by the time of the investigation [which occurred in the field three days after the incident]. The terms of the clearance contract required the demining group to clear a minimum number of square metres each day, so delaying operations until the investigation had been completed was presumably not possible. They were required to clear 800 square metres in each of the four sites where they operated.

The QA Monitor stated that he thought that clearance was too fast for safety, but had not written or verbally reported this prior to the accident. The clearance rate had been unusually high, but one day in the previous week had been lost because of rain, [so the Team Leader may have felt a pressure to increase clearance rates on the fine days].

Conclusions

The investigators concluded that the standard of marking in the field was inadequate, that the width of the cleared lane was "insufficient", and that the performance of the Team Leader was inadequate because he did not wear protective equipment, did not adhere to SOPs, moved in uncleared areas and failed to seal the site after the accident. They felt that the Team Leader's actions were "probably" influenced by the "clearance rate targets", and said that the QA monitor did not "sufficiently action his concerns" about speed and safety on the site. They added that "the aim of the clearance was unclear" and that the deminers appeared to be "searching for groups of mines shown on the minefield record". They also found the reporting regimes inadequate.

Recommendations

The investigators recommended that constant QA be applied to the marking and width of lanes and should always comply with company SOPs. They stated that protective clothing should always be worn by everyone "in or near" uncleared or suspect areas, and that the purpose of clearance should be checked to avoid "mine tracking" or mine-hunting and the partial area clearance that results.

Other recommendations included that the ambulance vehicle be appropriately converted and that the ambulance should not double as the communications vehicle when it is the only vehicle on site. Also that the QA monitor should report concerns on the day they first arose, and that personnel with prior knowledge of the mined area should "not be allowed to create an environment of false confidence" by giving the impression that the whereabouts of the threat is clearly known - "all areas should be demined systematically".

They stated that "safety and Quality Assurance should take a greater priority than clearance-rate targets".

Victim Report

Victim number: 295
Name: Name removed
Age:
Gender: Male
Status: supervisory
Fit for work: not known
Compensation: not made available
Time to hospital: 30 minutes
Protection issued: Frag jacket
Protection used: none
Long visor
Trousers/leggings

Summary of injuries:

INJURIES

minor Arm

minor Leg

severe Foot

COMMENT

No medical report was made available. See "Related papers".

Analysis

The primary cause of this accident is listed as a *"Management/control inadequacy"* because the Team Leader was in breach of basic SOPs and encouraging the deminers to work more quickly that was safe. He worked inadequately by clearing with a machete and stepped on a mine that he had missed himself. Management did not control him adequately, and the QA Monitor also failed in this regard. The secondary cause is listed as a *"Field control inadequacy"*.

While the victim was sub-contracted from another company who had apparently lied about his background, the commercial company employing him should have checked his experience and taken appropriate steps to either train or replace him.

The injuries resulting from stepping on a PMA-3 vary from traumatic amputation to minor bruising. The picture below shows why this happens. It shows a cut-away section through a PMA-3. The 35g Tetryl is in the top and centre of the mine. The area of pressure-plate surrounding the HE is actually larger than the area of pressure-plate over it. If a victim is fortunate, they step on the pressure plate but the explosive charge is not beneath their foot.

Related papers

The victim was evacuated to a hospital in the UK where a series of operations "saved" his foot. A TA visited him and found that he had been sent unaccompanied and without money or passport. He was unable to let his family know where he was or what had happened. The Gurkha support group was contacted and provided some assistance. He was reported to have been in England for almost a year before being released and flown back to Nepal where he lives in the Pokhara region (very mountainous).

The victim was covered by an insurance system which limited disability definitions to the loss of limbs or specified functions. The fact that this victim's foot was saved left him without compensation. The demining company was not to blame for this - it having provided the insurance dictated by the funder which was inadequately detailed and having paid for enhanced insurance to be provided by the Gurkha company from which the Victim was sub-contracted. In December 1999, the demining company reported that the insurers made a payment direct to the sub-contractor. It seems that this was not passed on.

Private sources indicate that the subcontractor company lied about the victim's previous experience and training, and also about the insurance cover that they provided.

Original BoI report

The following is the original BoI report, edited for anonymity. It covers two accidents that occurred at the same site on the same day.

23 July 1997

REPORT ON MINE ACCIDENT AT SEVARLIJE, NEAR DOBOJ

Reference A: Map, Series M709, Sheet 2784-III, Doboj. (WGS 84)
B: UN Mine Action Centre Technical Guidelines. Dated 12 July 1997.
C: [Demining group] Standing Operating Procedures for Demining. Dated May 1997.

INTRODUCTION

1. Two mine accidents occurred on 19 July 1997 at the same demining task site, near the Lime Factory at Sevarlije, Doboj. Grid Reference BQ683499. These accidents occurred at the same location and involved members of the same demining team. [Demining group], the company involved, reported the accidents to UN MAC on 19 July 1997.

2. On the day of the accidents UN MAC appointed [name excised] as a member of an investigative board to conduct an investigation and report about the accidents. Mr [name excised], Senior Technical monitor for World Bank demining projects in Republika Srpska was appointed as a member of the board and Mr [name excised], [Demining group] area manager represented the company but was not an investigating member of the board.

CONDUCT OF THE INVESTIGATION

3. [Name excised] and [name excised] deployed to [Demining group] regional HQ (The Lime Factory), from Sarajevo on 21 July 1997. [Name excised] arrived at the Lime Factory at 1500hrs, [name excised] arrived at 1900hrs. The Operations Director of [Demining group], Colonel [name excised] welcomed the team and stated that he was determined that his organisation would assist the investigation in every aspect. Throughout the entire investigation [Demining group] employees were open and helpful in every respect, this attitude assisted the team considerably.

4. Shortly after arrival of the investigation team at the Lime Factory, written statements were requested from all members of the team involved. Statements had already been written by four of the deminers prior to this time and these were translated into English on request. Photographs of the clothing worn by the injured personnel involved in the accidents were also provided. [Demining group] had prepared a table-top model of the area of the accidents, this model was marked with areas of specific interest and showed the mined and cleared areas and details of the task site. Paperwork and reports relating to the day of the accidents were prepared for the investigation team's inspection.

5. The team involved in the accidents had completed a 24 hours retraining period, as detailed in [Demining group] Standard Operating Procedures and the UN MAC Technical Guidelines.

6. Both members of the investigating board arrived on the task site at 0730hrs on Tue 22 July. At this time the area of the accidents was inspected and an assessment was made of the site layout and conduct of [Demining group] operations.

7. The injured deminer was interviewed in Doboj hospital on 22 July. It was not possible to interview the injured team leader because he had been evacuated to UK on the day of the accident.

8. Investigation lasted one day, this included interviews, writing of statements, visits to the site of the accident, inspection of documents & maps, and of clothing belonging to injured personnel.

GENERAL

9. [Demining group] relations with local people are generally good. This relationship is enhanced by the fact that several [Demining group] employees are from the local area. Deminers involved in clearance of this site also assisted in laying mines in this area during the war. However, this site was over-run several times during the conflict and mines are believed to have been laid here by both sides.

10. Personnel from [Demining group] started this task Saturday 19 July 1997. This task was part of a larger group of tasks and this team had been working in this area since 5 July. Doboj Municipality request for demining tasking in this area were provided to UN MAC Banja Luka on 26 May 1997. This task is number two on the list of Priority One tasks. Minefield records for the site are held by UN MAC and copies were handed to [Demining group] for use by the clearance team as part of the MAC task folder.

11. The minefield record showed that 16 PMA-3 and 6 PMR-2A Anti Personnel mines had been laid in the area in 1995. A copy of this record, in English and in original language is shown at Annex A. Further information about the locations of mines at this site was provided by [Demining group] deminer [name excised], a former VRS soldier, who had helped to lay some of the mines in this area during the war.

12. The task was being worked by a [Demining group] demining Team; this consisted of an international (Gurkha) member of staff as team leader, six deminers, a medic and a translator. This team was structured in accordance with [Demining group] regional structure.

13. The team travelled to work each day in an IVECO two-and-a-half-ton truck. Task site from [Demining group] location at the Lime Factory is approximately 1 kilometre, travelling time is approximately five minutes.

GEOGRAPHY

14. The task site area is on a former confrontation line, the area includes several bunkers and defensive positions, which were mined as part of the defensive plan. The area is heavily vegetated and is over what is probably pastoral land, no evidence of farming or livestock was observed. The nearest local residents to this site live approximately one kilometre away, in the village of Potocani. Mr [name excised] reports the task as being related to the clearance of the Lime Factory quarry and the incoming electrical power lines associated with this site. Priority for the task was set by the RS PIU. The area is not a UNHCR priority area.

15. [Demining group] personnel live in and deploy from [Demining group] local Headquarters at the Lime Factory, Grid Reference BQ680509. The Lime Factory is less than one kilometre from the accident site. All local employees live at the Lime Factory. The two International staff, Mr [name excised] and Mr [name excised] also live in the factory. The organisation at the factory is run on disciplinary lines. Local staff are allowed out only on weekends and there is a strict no-alcohol rule.

WORLD BANK/PIU CONTRACTS WITH [Demining group]

16. World Bank put out three bidding contracts, one of which was for clearance and survey work in RS. [Demining group] responded to this, winning the contract. [Demining group] bid stated their performance would be 200,000 square metres of survey per month and a clearance rate of 83,200 square metres per month. In order to achieve this target, [Demining group] is required to clear an average of 800 square metres on each of their four clearance sites daily.

17. Deminers and team leader are aware of this commercial aspect to the contract and some pressure is felt at this level. Statements from team members say that this pressure has caused work to progress more rapidly than they feel safe with.

SITE LAYOUT

18. The area of the task site, including access lanes and the Control Point is marked and taped-off. The area of the car park and the access lane from the car park to the start of the access lane to the Control Point is not marked. Marking in the clearance lanes is inadequate and inexact.

19. The clearance of access lanes into the mined area started directly from the side of a single-track, unsurfaced road.

20. The task was to clear an area of approximately1200 square metres of rolling countryside. Most of the area is around the top of a hill.

21. The cleared area of the lane in which the accident occurred consists of a lane approximately one metre wide. This lane follows a winding course through the suspect area. Total length of this clearance lane from the Control Point is approximately 350 metres. Two other clearance lanes were also initiated from the control point. These two lanes are towards different directions and are unrelated to the accident lane.

SUPERVISION AND QUALITY ASSURANCE

22. Supervision of clearance and survey teams in this [Demining group] region is provided, in the first instance, by team leaders, in this case the team leader was a former Gurkha engineer Warrant Officer with experience in humanitarian demining in Africa and Kuwait. The next line of supervision is provided by irregular visits to the sites by the Field Operations Officer. These visits are supported by occasional visits from the [Demining group] Operations Director, Col [name excised]. At the time of the accident Mr [name excised] was at [Demining group] HQ Pale. Col [name excised] was mobile towards Pale from Melici, approximately 100 Km away.

23. UN MAC Banja Luka Operations Officer states that on one occasion he was unable to gain access to the site because signing was inadequate and there was no guide or sentry posted at the main access point to the area. On the day of the investigation team's visit a signboard at the main access point directed visitors to sound their horn and wait for a guide.

24. A RS PIU monitor is on the site at all times. Mr [name excised] states that it was his opinion that the clearance was moving too fast for safe clearance of the area to be achieved. He had reported this opinion verbally to the team leader but had been over-ruled. The monitor did not report his concerns on this subject on any of his daily reports; neither did he mention this to the World Bank Senior Monitor.

25. World Bank Senior Monitor, Mr [name excised] visited a related site on 9 July prior to the move of operations to the area of the accident. On 9 July the operation of that related task was normal and no safety points were raised.

26. No site diary or record of visitors is kept to record visits.

27. The system for continuous Quality Assurance at this site is not clear.

COMMUNICATIONS

28. The accident occurred in Republika Srpska. The nearest large town is Doboj. The local Danish SFOR base has a military V-Sat telephone. It was not possible to gain communications with UN MAC Sarajevo on PTT or V-Sat using this telephone on 21 July 97.This link is not continuous or reliable.

29. [Demining group] communications to anywhere outside the region is generally by HF radio. No radio communication outside the task site exists. For communication beyond the task site it is necessary to drive to the top of the nearest hill in order to plug-in to an antenna mast. This set-up allows HF communications to [Demining group] HQ Pale and elsewhere.

30. [Demining group] Standing Operating Procedures state that under no circumstances will demining operations commence until radio communications have been established.

31. There is no operations room at [Demining group] regional HQ at the Lime Factory. Operations are commanded and controlled from a field level. Coordination is from HQ Pale. Field workers generally resolve their own problems.

32. No radio log was kept at this site.

MEDICAL

33. A comprehensive medical kit was on site at the time of the first accident. Medic was stationed at the Control Point, approximately 350 metres behind the scene of both accidents. Ambulance on the site is the Iveco two-and-a-half-ton truck. This vehicle is not fitted for use as an ambulance, in particular there is no provision for a stretcher to be fitted securely in the vehicle. This vehicle is also the team's HF radio vehicle and was the only vehicle on site on the day of the accidents. When the first accident occurred the injured deminer was carried to the medic at the control point. When the second accident occurred the medic and the only vehicle was at the hospital in Doboj with the first casualty.

34. Both Casevac operations were successful, in each case the injured person was stabilised and despatched to the hospital without further problems.

35. The nearest hospital to the accident site is at Doboj, approximately 10 Kilometres, travelling time is approximately 15 minutes.

36. The injured deminer has bruising and flesh injuries to his lower left leg and fractures to his left foot. The injured team leader has similar injuries. Medical reports were not available at the time of the investigation. It is expected that neither deminer will suffer amputation or loss of a limb.

37. No Medevac or Casevac practice exercises had been carried out at this site to the date of the accident.

PERSONALITIES

38. Personnel directly involved are as follows.
    a. Team leader – Injured in blast from second mine.
    b. Deminer no. 1 – Injured in blast from first mine.
    c. Deminer no. 2 – laid mines in area.
    d. Team Medic.
    e. World Bank Monitor at the site.

DOGS

39. No dogs were involved for mine or explosive detection or to assist Quality Assurance at this site at any time.

EQUIPMENT

40. The metal detectors used by [Demining group] on this site were Ebinger. Team members state that Ebinger works well in the Doboj area and results have been good. There have been no problems detecting PMA-2 or PMA-3 Anti-Personnel mines.

41. Prodders were used as a standard part of the demining team's equipment in the manner approved by the UN MAC Technical Guidelines. Team member's state that the Team Leader used a machete to clear foliage and to inspect uncleared ground in the accident lane before the accidents but did not use a prodder or metal detector. The Team Leader had used this system on other occasions to encourage deminers to clear areas faster.

DRESS

42. Full protective clothing and headgear is available for all vulnerable personnel in [Demining group] demining operations. Industrial working boots are issued to all demining personnel. Boots worn by both personnel injured in the accidents were damaged during the blasts. Cursory inspection indicates that wearing boots possibly mitigated injuries to feet.

43. All protective clothing provided by [Demining group] to demining teams is designed to provide a minimum protection to the wearer against 1.1g fragments travelling at a velocity of 450 metres per second.

44. Every deminer in every team is issued with a visor.

45. Deminer [Victim 1st accident] states that at the time of his accident he was wearing his visor and body armour.

46. Team Leader [Victim 2nd accident] was not wearing body armour or visor at the time of his accident. Statements from other team members indicate that he also did not wear protective equipment when he was working in the clearance lane.

DETAILED ACCOUNT OF ACTIVITIES ON 19 JULY 1997.

47. This account is taken from formal and informal interviews and statements from all personnel involved. Most interviews took place through interpreters.

48. Demining team departed [Demining group] local headquarters at Lime Factory as normal at around 0545hrs. They started work on the site at around 0600hrs, as normal. A daily briefing from the team commander is normally given to the team. According to statements from other team members, there is no formal structure to this daily briefing and it is unclear whether it occurred at all on the day of the accidents.

49. Lunch was taken for approximately half-an-hour, by all the team together, in the Control Point, at around 1100hrs, as normal.

50. Progress on the day before the accidents had been faster than on previous days. [Demining group] daily reports, completed by the World Bank monitor on the site, show that on the day before the accident (Friday), the team had cleared 1250 square metres of ground. On the Thursday they had cleared 850 square metres. On the Wednesday, 810 square metres. On the Tuesday rain had stopped work. On the Monday 620 square metres of ground were cleared. These clearance results were reported on a daily basis, both on the World Bank monitor's report and on the Company Team Leader's daily report. Team Leader's reports were unsigned by any other member of staff and information on these reports was unclear.

51. Some time after lunch, at approximately 1200hrs, the Team Leader moved deminers [name excised] and [Victim 1st accident] from one clearance area to another part of the minefield, approximately one hundred metres from where they had been working. The new clearance area was a continuation of a clearance lane that had already been started. This clearance lane was following or moving towards the line of suspected mines laid during the war by deminer [name excised]. The clearance lane did not follow any recognisable pattern or route, suggesting that the team were following the route of mines shown on the minefield record. This was probably because the original area for clearance was not defined with certainty and a considerable area of mined and suspect ground had to be cleared in order for the demining team to access their clearance area.

52. Deminers state that at this time, team leader [Victim 2nd accident] took the place of deminer number one. [Victim 2nd accident] led the way along the uncleared part of the clearance lane, using a machete as a clearance tool. He did not use a metal detector or a prodder. He led for approximately ten metres and at this point handed over the number one position to deminer [Victim 1st accident].

53. A PMA mine had been missed by the team and was now inside the "cleared" area.

54. At this stage [Victim 1st accident], with [name excised] as number two continued the clearance of this lane. Although they had approximately ten metres of ground behind them which had not been properly cleared, the clearance became normal again and continued in accordance with SOPs.

55. After this the clearance continued normally for approximately five metres, with [Victim 1st accident] leading and [name excised] behind, as deminer number two.

56. While he was clearing the forward edge of the lane, [Victim 1st accident] either disturbed or stepped on an Anti Personnel mine – Probably a PMA-3. It is possible that this mine was concealed below a small rock.

57. Team Leader [Victim 2nd accident], who was already very close to the injured deminer, and three other team members moved forward to the site of the accident and carried the injured deminer back to the Control Point.

58. When the other deminers moved forward to assist the injured man, they had to move over the part of the clearance lane that had not been properly cleared. This was the ground that [Victim 2nd accident] had led over earlier, using only his machete as a clearance tool. The team obviously did not know that there was another PMA in the ground they were moving over to reach their colleague.

59. Once the injured deminer arrived at the Control Point, the medic administered first aid and then accompanied the injured deminer in the truck to Doboj hospital.

60. The task site was now without a vehicle, medic or HF radio.

61. After [Victim 1st accident] had been despatched to hospital, [Victim 2nd accident] decided to go to the point of detonation of the mine. He also instructed three of the other deminers to go into their clearance lanes to collect tools and equipment. They all took the same route into the clearance lanes and the accident site as the team had taken earlier, when they evacuated [Victim 1st accident]. As he was walking over the ground he had earlier not cleared properly, [Victim 2nd accident] stepped on the "missed" PMA. This mine was in the centre of the clearance lane, less than ten metres back from the first explosion.

62. After the explosion [Victim 2nd accident] was removed to the Control Point. Coincidentally, the team's truck returned from Doboj hospital shortly after this time and was therefore available to carry [Victim 2nd accident] to the hospital.

SUMMARY

63. This Demining team was demining with minimum supervision in an area of difficult terrain. A minefield record and advice from personnel who laid some of the mines was used. Standard Operating Procedures were varied without reference to company management or headquarters. The Team Leader acted irresponsibly and the site was marked inadequately. Progress of clearance was probably too quick along the lane. Deminers missed a mine and, before this was realised one of them was injured by another mine. After the first accident, other deminers moved over the missed mine at least five times. The Team Leader and others entered the suspect area after the first accident had been dealt with and the Team Leader detonated the missed mine, by accidentally stepping on it. Reporting, supervision procedures, communications and transport were not adequate. From reports received from other sources, this site does not seem to be typical of [Demining group]'s operation in Bosnia-Herzegovina.

CONCLUSIONS

64. Standard of marking between safe and unsafe areas was not adequate.

65. Width of clearance lanes were not consistent

66. Standard of clearance in the accident lane was insufficient.

67. Performance of the Team Leader was inadequate. In particular the Team Leader;

    Did not wear protective equipment when moving in and near uncleared areas.

    Did not adhere to company Standard Operating Procedures.

    Moved in uncleared areas.

    Did not seal the site after the accident, in preparation for a subsequent investigation.

68. The following SOPs were varied during this task without any reference to higher authority.

    - Clearance lanes were not restricted to 1 metre width.
    - Clearance lanes and other areas were not adequately marked.
    - Clearance drills were not carried out in accordance with SOPs.
    - Protective clothing was not worn where it should have been worn.

- Personnel were moving in a suspect area without ambulance or medical cover on the site.
- Personnel were moving in a suspect area without radio communications at the site.
- Clearance rate targets probably influenced the Team Leader.
- The team's two-and-a-half ton vehicle was not prepared for use as an ambulance.
- Reports and Returns were not completed sufficiently or scrutinised properly after completion.
- The aim of the clearance was unclear. The team was searching for groups of mines shown on the minefield record.
- The World Bank Monitor did not sufficiently action his concerns about accident indicators such as speed and safety on the site.

RECOMMENDATIONS

69. The following recommendations are made.

- Marking and width of clearance lanes should be subject to a process of constant Quality Assurance. Standards of clearance should always be in line with company Standing Operating Procedures.
- All personnel working in or near suspect areas should wear protective clothing and equipment.
- Standing Operating Procedures of any demining organisation must not be varied in the field in any way without prior approval from a higher office.
- No movement should be allowed in any uncleared or suspect areas.
- Areas where a mine accident has occurred should be closed until a formal investigation team arrives to inspect the site.
- If parameters of a mine-clearance task are unclear, advice should be sought from the client, in order that mine tracking or partial clearance of a suspect area does not occur.
- Safety and Quality Assurance should take a greater priority than clearance-rate targets.
- Vehicles used as ambulances should be prepared and fitted for the task.
- If the ambulance/personnel and stores carrying vehicle is also to be utilised as the HF communications vehicle, additional radio communications or transport is required.
- When the site vehicle departs the site for any reason, including for a radio-check to Headquarters or to transport anyone anywhere, all demining work on the site is to cease.
- Supervision of teams at task sites should be subjected to a continuous regime of regular visits by managers or supervisors more senior than the team leader. These visits should be structured to check on safety, Quality Assurance and all other relevant aspects of the task.
- Reporting procedures and documentation should be reviewed generally. Daily reports should be scrutinised by management and actioned as required. Such activities as supervisory visits to sites and Casevac practices carried out should be recorded daily. These records should be checked and confirmed daily by headquarters staff. Every clearance site should maintain a site diary to record activities and visitors at the site.
- Team leader should have regular or constant access at the task site to a higher level of management, who can give immediate advice or supervision.

- If suitable solutions are not found to alleviate concerns about demining activities from World Bank monitors immediately, these concerns should be referred by monitors to the World Bank Senior Monitor on the day that they are first raised.
- Personnel with prior knowledge of a mined or suspect area must not be allowed or encouraged to create an environment of false confidence at a clearance site. All areas of minefields or suspect areas that have been mined or re-mined by Former Warring Factions should be treated equally. No assumptions should be made and all areas should be demined systematically.

Signed: World Bank rep., UN Mine Action Centre

Distribution
Programme Manager UN MAC
World Bank
PIU Republika Srpska
[Demining group]